

tains a telegraphic intimation from the Smithsonian Institution of the discovery of a new minor planet by Prof. Peters in R.A. 17h. 21m., and N.P.D. $113^{\circ} 21'$. It is as bright as stars of the eleventh magnitude, and is No. 144 of this group of planets.

[Since the above was in type we receive notice of the discovery of No. 145, by Prof. Peters, in R.A. $17^{\text{h}} 14^{\text{m}}$, N.P.D. $113^{\circ} 8'$, apparently on June 4. Motion towards S.: twelfth magnitude.]

LECTURES AT THE ZOOLOGICAL GARDENS * VI.—Mr. Flower on Elephants.

WITH the exception of the domesticated species few mammals are so well known to everyone as the Elephant, few are more interesting from their sagacity and usefulness to mankind, and few are so wholly separated and isolated from all other forms which now exist. Formerly the Elephants were grouped with the Rhinoceroses or with the Pigs, but a better knowledge of their structure has shown that they form an entirely distinct order, to which the name *Proboscidea* has been given, on account of the trunk, or proboscis, which is one of their most striking features. Two well-marked species of Elephant exist, the Indian (*Elephas indicus*) and the African (*E. africanus*).

The former is found in a wild state throughout the forest-lands of the greater part of India, Ceylon, Burmah, Siam, Cochinchina, the Malay Peninsula, and Sumatra, except where it has been driven back by the advance of civilisation; whether it is indigenous to any of the other islands of the Eastern Archipelago is doubtful. The Elephant of Sumatra and Ceylon has been separated by Schlegel as a distinct species, *E. sumatranus*, but Dr. Falconer and others have shown that their differences, though appreciable, do not amount to specific characters. The Indian Elephant has been domesticated from the earliest ages—in India before historic times, and also by the ancient Persians. It has been used in war, in carriage, and in state pageants, and is still much employed in road-making and bridge-building, where its strength, its sagacity, and its adroitness in piling logs, lifting weights, and similar operations, render its services invaluable.

The second species inhabits Africa, south of the Sahara, from the Indian Ocean to the Atlantic, and formerly extended its range to the Cape of Good Hope. In ancient times it was domesticated by the Carthaginians, and was the species generally imported by the Romans, but no succeeding African race has had the sagacity to make use of it. It is killed in vast numbers for the sake of its ivory, of which an enormous quantity is annually brought to Europe; and in so wasteful a fashion is this slaughter carried on, that the species will probably soon be exterminated. Although so well known to the ancients, it is only quite recently that live African elephants have been brought to Europe in modern times. There was one in Antwerp in 1863, and two years later a pair were obtained by the Zoological Society, which are still alive and well, the male having attained a height of ten feet. Since this, numbers of these animals have been imported down the Nile from the Soudan, and they are now common in menageries.

In size there is not much difference between the two species, and the maximum height would appear to be about eleven feet; an Indian elephant shot by Sir Victor Brooke reached that stature, which was not exceeded by the tallest of eleven hundred individuals measured by Dr. Falconer. In external appearance the two species are easily distinguishable. The African elephant has a lighter and more shapely head, a less protuberant forehead, and a larger eye, but its most striking peculiarity is the enormous size of its ears. It also stands proportionately higher on its legs, and has a more arched back.

* Continued from p. 93.

The number of nails is different, being four on the fore feet and three on the hind, whereas in the Indian species these feet have four and five nails respectively. Sportsmen say that the height of an elephant always equals double the circumference of the foot, and this is confirmed by the individuals now in the Gardens; in the male the proportion is absolutely correct, and in the female it is within three inches. The mental characters of the Indian and African elephants are different, the latter being bolder, quicker, and more obstinate.

In considering the general structure of the Elephants, the first peculiarity to be noticed is the trunk, which is really an enormous prolongation of the nose and upper lip. It is almost entirely composed of a complex mass of muscles which give it its great power and flexibility, and it is amply supplied with nerves. The great massiveness of the head is not owing to the size of the brain, but to huge air-cells in the body of the bones, which are an extraordinary development of the frontal sinuses. This expansion is necessary to afford room for the attachment of the great muscles which wield the head and proboscis.

The teeth of the Elephant are very peculiar. The tusks, which answer to the middle incisors of man, sometimes reach a weight of 150 lbs., or even, it is said, of 200 lbs. each. They have no enamel, being entirely composed of *ivory*—a peculiarly fine, tough, and elastic dentine—and are persistent in growth throughout life. Thus, if bullets happen to lodge in the pulp-cavity they are carried down by the growth into the tusk itself, in which they are sometimes found embedded. The molars are six in number in each side of each jaw, and are composed of alternated transverse plates of enamel, dentine, and cement. Owing to the different hardness of these materials they wear unequally, and produce cross ridges on the surface of the tooth, which form it into an admirable grindstone for crushing the food. The molars are not deciduous, but move forward in a curious way; only one (or at most a part of two) is in use at once, and each as it is worn away is pushed forwards by its successor, which eventually takes its place. The six teeth last out the life of the animal, which is said to extend to a hundred years or more. In the Asiatic species the plates of the molars are much finer and more regularly parallel than in the African elephant, in which they are fewer in number and have somewhat of a lozenge shape.

It was formerly a widespread delusion that the Elephant had no joints, and even now many people believe that their joints move in the contrary way from those of other quadrupeds. The explanation of this lies in the fact that the elbow and knee of an elephant are much nearer the ground than those of a horse or a cow, and are thus confused by a casual observer with the so-called "knee" (the true wrist) and "hock" (the true ankle) of the latter animals.

Although the Elephants are now so isolated among animals, it was not always so. They have many fossil relatives whose range once extended all over Europe (including Britain), Asia, North America, and part of South America. Of these the most generally known is the Mammoth, of which specimens have been so wonderfully preserved in the Siberian ice, and which was closely allied to the living Asiatic species. Going further back we have the Mastodon, in which the grinding teeth were much less differentiated and more like those of other animals. Beyond this it is difficult to trace their relationships. Possibly they may have been through the Dinosaurium, or through some of the wonderful creatures whose remains have recently been discovered in the Eocene formations of America. But it is clear that in the Elephants we have the last remaining representatives of a mighty and once numerous race which have played their part in nature and disappeared, and it is only too probable that the survivors also are doomed to speedy extinction.